Wisconsin's Northern State Forest Assessments:
Community Restoration and Old Growth on the Northern Highland – American Legion State Forest

Executive Summary

The Community Restoration and Old Growth Assessment Team (CROG) developed and applied a process using ecological criteria to identify, rank, and map plant community and old growth restoration potentials and opportunities. A local landscape database for the Northern Highland-American Legion (NHAL) State Forest was developed.

To determine the role that the NHAL State Forest can play in conserving the regional ecology, the composition and structure of past and present plant communities in the regional landscape was assessed. The assessment included the relative size, age, and distribution of plant communities as well as their natural disturbance regimes, successional trends, and ecological potential. Two questions were posed.

First, what natural plant community types occur on the NHAL and which have the greatest ecological potential for successful restoration and/or development of old growth characteristics?

Second, of the natural plant communities with the greatest ecological potential, where are the best sites on the NHAL to restore selected communities and/or develop old growth characteristics?

Plant Communities (Vegetation Associations)

Twenty-nine terrestrial and wetland plant communities were identified on the NHAL. These communities include 11 upland forest, 7 lowland forest, 7 lowland non-forest, and 4 upland non-forest communities. In addition, 6 aquatic and 3 miscellaneous categories were recognized.

Currently, the major plant communities on the NHAL include: aspen (33.7%), bog/sedge meadow/fen (13.2%), red pine (7.4 %), red oak (7%), white birch (5%), forested wetlands (4.2%), alder thicket (3.5%), jack pine (3.5%), white pine (3.3%), European grass (2%), and hemlock-hardwood (1.5%). Of the actively managed forest on the NHAL, 44% is between 1 and 40 years old, 22% is between 41 and 80 years old, 31% is between 81 and 120 years old, and 3% of the forests on the NHAL exceed 120 years in age.

Today's plant communities have changed in composition and structure from those plant communities present in the NHAL region in the 1860s. The major changes have been a decline in the distribution and age of red and white pine in the uplands and tamarack in the lowlands. Fire is the major natural process excluded from today's NHAL forests.

Community Restoration and Old Growth Assessment

To evaluate these plant communities eight evaluation classes were selected. The evaluation classes were: community age, current acres, current abundance, presettlement abundance,

ecological potential, amount of DNR ownership, and significance of the communities in the Regional Ecology Assessment and the Biodiversity Assessment.

SUMMARY OF RESULTS

Opportunities for Old Growth	**Opportunities for Restoration**
5 Communities	**5 Communities**
White Pine	White Pine
Red Pine	Red Pine
Hemlock-hardwood	Hemlock-hardwood
Northern hardwood	Tamarack
Red Oak	Jack Pine

Opportunities for Special Management

Perpetuate and Maintain Rare Upland Communities

Bedrock Glade (~ 1 acre)
Ephemeral Pond
Bracken Grassland (~1000 acres)*
Pine Barren (~100 acres)*
Scrub Oak (~800 acres)**

*Requires active management to maintain the community.
**Requires clearcutting to maintain the community.

Protect Lake Communities

Lakes and Shorelines
Emergent Aquatic beds
Interior Beach

Perpetuate and Maintain Uncommon and Rare Wetland Communities

Large Open Bogs*
Poor Fen
Northern Sedge Meadow
Shrub-carr
Boreal Rich Fen
Swamp Conifer (~700 acres)
Swamp Hardwood (~700 acres)
Northern White Cedar (~1500 acres)
Bottomland Hardwood (~600 acres)

*May require active management to maintain the community.

Communities not included in community restoration, old growth development, or special consideration for the purposes of this assessment

Aspen, White Birch, Red Maple, Fir-Spruce, Black Spruce, Alder Thicket, Upland Brush, and European Grass.

These are important plant communities but they ranked low for community restoration and old growth. In the normal course of forest management, representation of extended rotations, and perhaps old growth, could be considered, especially in the context of landscape scale management to provide buffers and corridors.

RESULTS: COMMUNITY RESTORATION

Community Restoration refers to a process that moves the current composition and structure of a plant community to a composition and structure that more closely resembles that of the 1860s vegetation.

White and Red Pine Communities

The best potential for restoring these communities is to restore mixed stands throughout the NHAL as opportunities arise. Big Tree Silviculture, underplanting of white pine, prescribed fire, canopy manipulation, seedbed preparation, and natural succession are possible management actions to slowly increase the distribution and abundance of mixed white and red pine communities.

Jack Pine Communities

The jack pine community could be restored, in part, through maintenance and regeneration of existing sites. It would be valuable to explore planting, natural regeneration methods, and prescribed fire on forest habitat sites best suited for jack pine.

Hemlock-Hardwood Communities (mainly hemlock, yellow birch, and white pine)

Maintaining and expanding existing sites while exploring planting opportunities on forest habitat sites best suited for eastern hemlock would provide a good strategy for management of this community. Explore natural regeneration opportunities where scattered individuals occur.

Tamarack Communities

Many small and medium-sized open bogs and poor fens could convert to tamarack through natural succession.

RESULTS: OLD GROWTH – WHERE AND HOW MUCH?

In essence, old growth forests are those forests that are relatively old and relatively undisturbed.

White pine, red pine, hemlock-hardwood, northern hardwood, and red oak stands were selected as potential old growth sites using the following criteria:

- At least 100 acres in size.
- At least 60 years old.
- At least 50% DNR ownership.
- All small stands older than 80 years.

Stands were then aggregated to form 52 larger sites to evaluate. The 52 potential old growth sites were ranked based on the following criteria:

- Age: older aged stands were ranked higher.
- Patch: larger sites were ranked higher.
- Cover: sites in close proximity were ranked higher.
- Age 2:   old sites close and old sites of a different community were ranked higher.
- Matrix: sites with less biological contrast were ranked higher.
- NC Use: sites with less non-compatible use were ranked higher.
- NHI: sites with greater Natural Heritage Inventory value were ranked higher.
- EO's: sites with more NHI element occurrences were ranked higher.

The ranking resulted in the identification of 5 old growth opportunity classes:

06 sites were ranked A   Best opportunity for old growth.
14 sites were ranked AB
13 sites were ranked B   Good opportunity for old growth.
12 sites were ranked BC
07 sites were ranked C   Moderate opportunity for old growth.

The 52 sites ranged from 71 to 4,500 acres in size and total 30,950 acres (14% of the NHAL). Figure 7 shows the location of the 52 candidate old growth sites. Most sites are combinations of the five old growth communities.   Many of the mapped sites have inclusions of stands not considered for old growth such as wetlands, aspen, lakes, and road corridors. Descriptions of the 52 sites are found in the complete CROG assessment.

In addition, all small stands of natural origin red pine, white pine, and eastern hemlock that were less than 100 acres in size and more than 80 years old (4,732 acres) could be considered for development of old growth characteristics when the surrounding forest is managed.

Note: A description and map of the 52 NHAL Old Growth Sites can be found in the NHAL Sourcebook and in the complete CROG assessment.

ADDITIONAL INFORMATION AVAILABLE IN THE FULL CROG ASSESSMENT

Local Ecological Assessment

An extensive database that summarizes the local forest community ecology of the NHAL was developed.

1860s Forest

An extensive database that contains information on the distribution, composition, structure, and natural disturbance regimes of the 1860s forest in the NHAL Region was developed.

Maps

Eight maps of the forest communities, age classes, and other ecological attributes were developed for this assessment.